The evolution, etiology and eventualities of the global health security regime

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Background	Attention to global health security governance is more important now than ever before. Scientists predict that a possible influenza pandemic could affect 1.5 billion people, cause up to 150 million deaths and leave US$3 trillion in economic damages. A public health emergency in one country is now only hours away from affecting many others.
Methods	Using regime analysis from political science, the principles, norms, rules and decision-making procedures by which states govern health security are examined in the historical context of their punctuated evolution. This methodology illuminates the catalytic agents of change, distributional consequences and possible future orders that can help to better inform progress in this area.
Findings	Four periods of global health security governance are identified. The first is characterized by unilateral quarantine regulations (1377–1851), the second by multiple sanitary conferences (1851–92), the third by several international sanitary conventions and international health organizations (1892–1946) and the fourth by the hegemonic leadership of the World Health Organization (1946–????). This final regime, like others before it, is challenged by globalization (e.g. limitations of the new International Health Regulations), changing diplomacy (e.g. proliferation of global health security organizations), new tools (e.g. global health law, human rights and health diplomacy) and shock-activated vulnerabilities (e.g. bioterrorism and avian/swine influenza). This understanding, in turn, allows us to appreciate the impact of this evolving regime on class, race and gender, as well as to consider four possible future configurations of power, including greater authority for the World Health Organization, a concert of powers, developing countries and civil society organizations.
Conclusions	This regime analysis allows us to understand the evolution, etiology and eventualities of the global health security regime, which is essential for national and international health policymakers, practitioners and academics to know where and how to act effectively in preparation for tomorrow's challenges.
Keywords	Health security, global health governance, regime analysis, communicable disease control, quarantine, globalization, International Health Regulations, World Health Organization

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KEY MESSAGES

- The principles, norms, rules and decision-making procedures by which states govern health security have evolved synchronously over time in four separate phases as responses to globalization, changing diplomacy, new tools and shock-activated vulnerabilities.

- Contemporary manifestations of these four catalytic agents of change and the distributional consequences of the current regime on class, race and gender point to the emergence of a new period of global health security governance to replace the existing one.

- Challenges to the current regime are likely to result in one or a combination of several possible configurations of power involving the World Health Organization, a concert of powers, states and/or civil society organizations, each of which carry significant implications.

- Regime analysis shows that the existing architecture for global health security is likely in transition, which should encourage national and international health policymakers, practitioners and academics to plan now in order to effectively prepare for it.

Introduction

Attention to the global governance of health security is more important now than ever before. Three million people travel by airplane each day and goods are shipped worldwide at unprecedented volume and speed. The World Health Organization (WHO) estimates that a public health emergency in one country is only a few hours away from affecting another. And the consequences are staggering. The fallout from Severe Acute Respiratory Syndrome (SARS) in 2003 revealed just how devastating a breakdown in health security can be, halting all travel to affected areas, causing severe economic hardship and prompting total international isolation. The current influenza A(H1N1) pandemic highlights that no city or region is immune from such calamity no matter how healthy or wealthy their populations may be. Scientists predict that a future influenza pandemic could be much worse, affecting 1.5 billion people (WHO 2007c), causing up to 150 million deaths (United Nations 2005) and leaving US$3 trillion in economic damages (Gale 2008).[1] This terrifying reality has catalyzed renewed global interest in the health security mechanisms that national governments and international organizations predict will be necessary to contain 'inevitable' pandemics of the future (WHO 2004; World Bank 2006).

Recent academic publications and discussions in the World Health Assembly have demonstrated that there is no consensus on the meaning of 'health security' among researchers and policymakers (Aldis 2008). For the purposes of this analysis, global health security is defined narrowly as the collection of preventative and response activities that minimize the vulnerability of populations to communicable disease transmission across geographical, national or regional boundaries (WHO 2007c). It is distinguished from the related 'health protection' and 'human security' concepts by its focus on protecting *entire populations*, rather than individuals, from threats of global proportion that can spread menacingly irrespective of established natural or political borders. The term 'global health security regime', therefore, can be defined as the implicit or explicit principles, norms, rules and decision-making procedures (Krasner 1983) by which international actors (including both states and civil society organizations) aim to protect their constituencies from the transmission of diseases from one area to another.

A review of historical analyses shows that the global governance of health security has not remained constant. Indeed, the nature, extent and understanding of threats to health security, as well as the international approach to mitigating them, have all evolved synchronously in punctuated equilibrium. The dramatic changes witnessed by the world over the last century mirror those that were seen over the several hundred years that preceded it. The global response to health security threats transformed accordingly. Understanding the evolution and etiology of each successive period of global health security governance will help us to predict possible configurations of power that may eventually arise. This understanding, ultimately, will better enable us to prepare for them.

This paper will first propose four periods of global heath security governance by which the major causes of regime change can be distilled. Consideration will then be given to contemporary manifestations of these catalytic agents of change and whether we are currently witnessing the emergence of a new regime. The distributional consequences of the current health security regime will be evaluated and four potential future orders will be explored. Understanding the role that WHO, the G8/G20, developing countries and civil society organizations may have to play in the future is necessary to know where and how to effectively prepare for and respond to such eventualities.

Evolution of the global health security regime

International approaches to governing health security can be divided into four stages based on the core principles, norms, rules and decision-making procedures that prevailed at those times on a global scale (see Table 1). The first regime (1377–1851) is characterized by the invocation of unilateral quarantine regulations by many European ports and extends back to the bubonic plague of the 14th century. At this time there were limited mechanisms for international cooperation (Allen 1950), few international travelers, uncertainty regarding

Table 1 Evolution of the global health security regime

Regime	Description	Key characteristics				Agents of continuity
		Principles	Norms	Rules	Procedures	
I	Unilateral quarantine regime (1377–1851)	• Disease causation unknown • Population as power • Europe vulnerable to 'foreign' diseases	• Limited international cooperation • State sovereignty	• Quarantine by land and sea • (ad-hoc and uncoordinated)	• Extremely limited • Sanitary councils (e.g. Alexandria, Constantinople and Tangier)	• Uncertainty of disease etiology • No alternative to quarantine was known or available • Political utility
II	Nascent sanitary conference regime (1851–92)	• Contagiousness of only certain diseases • Europe vulnerable to 'foreign' diseases	• Nascent international cooperation • State involvement in health issues • State sovereignty	• Quarantine by land and sea • (ad-hoc and uncoordinated)	• Conference diplomacy	• Uncertainty of disease etiology • Potential harm of new rules to commercial interests
III	Institutionalized Sanitary Coordination Regime (1892–1946)	• Broad acceptance of germ theory • Self-interest for disease eradication everywhere • Europe vulnerable to 'foreign' diseases	• Institutionalized international cooperation • State sovereignty	• International sanitary conventions	• Multiple international organizations • Conference diplomacy	• Existence of three international health agencies • Success in coming to agreement on the International Sanitary Conventions
IV	Hegemonic health cooperation regime (1946–????)	• Universal adoption of germ theory • Health for all • Right to health • Link between health and security	• Institutionalized international cooperation • State centricity • State responsibility for health	• International Health Regulations • Resolutions of the World Health Assembly	• WHO • World Health Assembly	• Near-universal state participation • New International Health Regulations • WHO's early successes

Notes: 'Principles' are defined as beliefs of fact, causation and rectitude. 'Norms' are standards of behavior defined in terms of rights and obligations. 'Rules' are defined as specific prescriptions or proscriptions for action, and 'decision-making procedures' are prevailing practices for making and implementing collective choice (Krasner 1983).

the cause of disease (Howard-Jones 1950), strong views on state sovereignty and exclusive territoriality—which included the right to unilaterally impose restrictions on others—and the perspective that Europe must be protected from 'foreign' diseases (Aginam 2004). Having proved ineffective, costly and susceptible to abuse (Harrison 2006), unilateralist approaches to communicable disease control were replaced with a second regime (1851–92) of nascent international dialogue and security harmonization via a series of International Sanitary Conferences. While encouraged to collaborate by fear of cholera pandemics, the outcomes of the first six gatherings were limited due to contradictory medical testimony, disagreement on disease etiology and overriding commercial interests (Howard-Jones 1975; Cooper 1989). These meetings, however, fostered the creation of a common vocabulary with which countries could communicate and achieve agreement in the health arena (Bynum 1993; Fidler 2001; Stern and Merkel 2004) and implicitly demonstrate recognition for the importance of tackling communicable diseases from a global perspective—a marked departure from previous approaches.

The third global health security regime (1892–1946) moved the early sanitary conferences forward with a new sense of institutionalized coordination structured by several international legal conventions and three intergovernmental organizations: the Pan-American Sanitary Bureau (1902), Office International d'Hygiène Publique (1907) and the League of Nations' Health Organization (1923) (Cooper 1989). The contagion theory of

disease prevailed despite the plethora of 'incidental interests' (*The Lancet* 1892) and formal diplomacy advanced concurrently with communication and transportation technology. World War II and the collapse of the League of Nations, however, catalyzed transition to the fourth global health security regime (1946–????), which engendered a time of internationalism, multilateralism and universalism, whereby global health security was facilitated collectively through WHO as a single and comprehensive health agency. Today the organization has 193 member states (WHO 2010a) and a secretariat of 8000 staff spread across 147 country offices, six regional offices and one headquarters (WHO 2010b). Despite its increasingly expansive mandate (Garrett 1996), communicable diseases remains its core activity and the disproportionate focus of its budget (Stuckler *et al.* 2008). WHO has become a global hub for health security—albeit with questionable moral authority and effectiveness.

The history and evolution of global health security highlight several agents of continuity. These include entrenched political power, scientific uncertainty, limited options and the desire to both maximize sovereignty and promote national commercial interests. For example, the lack of alternatives to quarantine in the first period, the uncertainty of disease etiology and importance of commercial interests in the second, the existence of three international health agencies in the third, and the near-universal state-based membership of WHO in the fourth period have all been highly influential in deterring transformation (see Table 1).

Table 2 Etiology of the global health security regime

Regime change	Turning point (event / year)	Key catalytic agents of change			
		Globalization	Diplomacy	New tools	Shocking events
» I	Quarantine regulations in Ragusa (1377)	• Maritime trade	• Limited diplomacy	• Limited medical knowledge	• Bubonic plague in Europe
I » II	1st International Sanitary Conference (1851)	• Expansion of trade • International travel • Porous national borders	• Formalized diplomacy • Conference diplomacy • International consciousness	• Some recognition for disease contagiousness • Continued debate on disease etiology	• Cholera epidemics in Europe • Failure of congress system and rise of conference diplomacy
II » III	1st International Sanitary Convention (1892)	• Further expansion of international trade • New communication technologies (e.g. telegraph) and modes of transportation	• Conference diplomacy • International laws and organizations	• Dominance of contagionist school • Disease pathogenesis	• Cholera pandemic • Intense fear of epidemics coming to Europe via Suez Canal
III » IV	Ratification of the WHO's Constitution (1946)	• Further expansion of international trade • More advanced communication technologies • Faster transportation	• Intense multilateralism and internationalism • United Nations System • Decline of colonialism and trustee system • Failure of International Sanitary Covenants	• Capacity to detect, treat and prevent most diseases • Health as a state of physical, mental and social well-being	• World War II • Collapse of the League of Nations • Creation of the United Nations System
IV » V	Unknown (????)	• Proliferation of global health security organizations • Instant communication technologies • Increasing volume and speed of air, land and sea transportation	• Less confidence in the United Nations System • Proliferation of international fora (e.g. G8/G20, World Bank, Global Fund) • Renewed interest in global health law, human rights and health diplomacy	• Scientific revolution in medicine & technology • Recognition of health's social determinants • Relative simplicity of launching bioterrorist attacks	• Tokyo's sarin gas attacks (1995)? • Terrorist attacks of September 11 (2001)? • Global Health Security Initiative (2001)? • SARS (2003)? • International Health Regulations (2005)? • H1N1 pandemic (2009)?

Notes: The key catalytic agents of change for each period of the global health security regime are highlighted and categorized according to their respective time of transition. The typology of change agents (i.e. globalization, diplomacy, new tools and shocking events) was developed in this paper based on a historical analysis of the evolution of global health security governance.

The primary causes of regime change are equally clear. First, globalization and the sheer volume of trade, travel and tourism has made national borders ever more porous (Yach and Bettcher 1998a, 1998b; WHO 2007c). As a result, states face progressively more dangerous threats to their population's health security (Lee and Dodgson 2000), far greater incentives to collaborate on public health issues (Gostin and Archer 2007) and mere hours to prepare for pandemics (Dr Margaret Chan, personal communication, 4 July 2008). This has encouraged states to restrain their power, set binding commitments and relinquish some control to multilateral institutions. Second, innovations for increasingly institutionalized mechanisms of multilateral dialogue, like conference diplomacy (early 19th century), international organizations (late 19th century) and the United Nations (1945) (Ikenberry 2001), have enabled increasingly cooperative stages of global communicable disease control. Contemporary examples include the proliferation of civil society organizations, complex government networks (Slaughter 2004) and powerful multilateral forums like the G8, G20 and APEC. Third, medical knowledge has facilitated greater and more sophisticated tools for governments to coordinate their health security efforts, with global action historically dependent upon scientific consensus. Finally, each regime transition has always been accompanied by a shocking event that highlights a particularly devastating vulnerability. Whether bubonic plague, epidemics of cholera or World War II, catalytic triggers—often in the form of a cataclysmic incident—have brought states together and made international collaboration politically advantageous (see Table 2).

Existential challenges and the emergence of a new global health security regime

Contemporary manifestations of these catalytic agents of change and other developments over the past decade have collectively challenged the existing global health security regime such that a new one may be emerging (or may indeed have already emerged). Moving from a position of unquestioned dominance 60 years ago to an environment in which it is heavily criticized (Brown *et al.* 2006; Lee *et al.* 1996; UK House

Box 1 Applying a hegemonic transition framework to predict the World Health Organization's possible decline in the governance of global health security

The World Health Organization became a hegemonic health security power in 1948 by supplying world governance capabilities and generating demand for such governance by offering system-level solutions to system-level problems. It fostered systemic expansion in the global health security field by leading its structural reorganization (e.g. revision of the International Health Regulations in 1951, 1969 and 2005) and its activities served as a model for emulation (e.g. World Bank, Gates Foundation, Médecins San Frontières). This, in turn, ironically worked to undermine the organization's hegemony itself. As competition in the health security field increases along with the volume and density of the system, a hegemonic crisis may ensue (or may already have commenced). Such a crisis is typically characterized by three processes: (1) intensification of inter-enterprise competition (e.g. proliferation of civil society organizations); (2) escalation of social conflicts (e.g. between developed and developing countries); and (3) interstitial emergence of new configurations of power (e.g. the G7's Global Health Security Initiative). While this self-reinforcing crisis is eventually supposed to lead to a total hegemonic breakdown, it is also said to facilitate evolution with the emergence of a new hegemony that has greater concentration of organizational capabilities and a higher system volume and dynamic density to organize (Arrighi and Silver 1999).

Notes: This framework, originally designed to predict the rise and fall of state superpowers, is applied to the World Health Organization's current dominance in the global health security field to provide further evidence that a regime change may be forthcoming in the near future.

of Lords Select Committee on Intergovernmental Organisations 2008), it is clear that WHO lacks the authority and resources commensurate with its vast responsibilities. It is unable to coordinate all global communicable disease control activities (Gostin 2009; Ruger and Yach 2009) and has been criticized as 'bureaucratic', 'complex' and 'outdated' (Godlee 1994; Peabody 1995; Stern and Merkel 2004). Even its independence and impartiality are threatened (Calain 2007a). Applying a traditional political science analysis of hegemonic transitions to this field also reveals that the elements may be in place for a new global health security power to emerge (Box 1) (Arrighi and Silver 1999). Insights from political economy and the recent global financial crisis point to a similar conclusion (MacLean *et al.* 2009).

Globalization and the limitations of the new International Health Regulations

Despite the optimism surrounding their recent ratification, WHO's new International Health Regulations (2005) have been subjected to just as much criticism as praise. There is no doubt that the new agreement includes several significant improvements from its 1969 predecessor: it increases the number of diseases for which the rules apply; expands the variety of events for which WHO must be notified; allows the organization to investigate, assess and declare public health emergencies of international concern and issue formal recommendations; requires the appointment of national health security focal points who liaise with WHO; requires states to develop their own capacity for disease surveillance, response and border control; obliges developed countries to assist developing countries in achieving these core public health capacities; and permits WHO to accept surveillance information from non-state sources (WHO 1969; WHO 2005; Fidler and Gostin 2006; Baker and Forsyth 2007; McDougall and Wilson 2007). Each of these provisions challenges the traditional Westphalian bargain of exclusive state authority in international affairs and empowers WHO as an independent global actor.

However, the new regulations also contain no legal enforcement mechanism (Sturtevant *et al.* 2007), rely upon peer pressure and public knowledge for compliance (Wise 2008), emphasize surveillance to the exclusion of other essential elements (*The Lancet* 2004), remain difficult to implement in federated countries (Wilson *et al.* 2006; Wilson *et al.* 2008a; Wilson *et al.* 2009), provide opportunities for the politicization of epidemic responses (Suk 2007), depend upon national governments' acquiescence to new global health responsibilities (Merianosa and Peiris 2005), fail to specify how national governments are actually supposed to collaborate with one another (Bhattacharya 2007), narrowly define health security (*The Lancet* 2007), and rely upon surveillance networks in developing countries which may not be functioning optimally (Wilson *et al.* 2008b). Indeed, the very effectiveness of the International Health Regulations in preventing deadly epidemics and responding to outbreaks, their *raison d'être*, has been called into question.

Yet in addition to the structural weaknesses of the new rules, ambiguity has led to divisions between developed and developing countries. Indonesia, for example, refused to share H5N1 virus samples in February 2007 because it doubted that it would ever benefit from such scientific collaboration, particularly in the desired form of technology transfers or vaccine provision (Enserink 2007). Supported by most of the developing world, Indonesia demanded guaranteed access to future vaccines for poorer states that carry a disproportionate burden of the relevant disease, and justified these demands by invoking the principles of sovereignty over biological materials, transparency of the global health system, and equity between developed and developing countries (Sedyaningsih *et al.* 2008). While viral sharing eventually resumed following a WHO-brokered provisional compromise (WHO 2007b), this ongoing dispute highlights the fact that ambiguity and political considerations continue to challenge the regulations' real-world implementation and effectiveness. It also highlights the existing divisions between developed and developing countries, which no doubt serve as a destabilizing force. Indeed, deliberations at subsequent WHO meetings have shown that there is not even consensus among states for the conceptualization of virus sharing as a health security issue (Aldis 2008).

Changing diplomacy and the proliferation of global health security organizations

The past decade has also witnessed challenges to the entire United Nations (UN) System (of which WHO is part) and the emergence of several new players involved in coordinating, funding and implementing global communicable disease control activities. The optimistic expectations for global cooperation and an end to international conflict via the UN have given way to criticism of this diplomatic system, assumption by civil society of increasingly important roles, greater violence and more emergency health situations. Recognized contemporary challenges to the UN include widespread cultural diffusion resulting in higher expectations, detachment from multilateralism by developed countries, self-interest defined in domestic terms, memories of recent failures (e.g. to contain the global HIV/AIDS pandemic) and greater attention on relieving conflict than promoting well-being. In terms of its financial importance, a mere US$5 billion was disbursed through the UN System in 1996 as compared with the approximately US$55 billion that was given by national bilateral aid agencies (Walt 1998). This trend applies equally to development assistance for health, which in 2007 was channeled in much larger sums through bilateral development agencies (US$7.4 billion) and non-governmental organizations (US$4.5 billion) than through all the UN's various agencies, funds and programmes combined (US$3.1 billion) (Institute for Health Metrics and Evaluation 2009).

Today there are also numerous players involved in global communicable disease control, including other multilateral organizations (e.g. Joint United Nations Programme on HIV/AIDS, World Bank, World Trade Organization, United Nations Children's Fund, United Nations Population Fund and European Community), philanthropic foundations (e.g. Gates Foundation, Kellogg Foundation and Rockefeller Foundation), international partnerships (e.g. GAVI Alliance, International Health Partnership, Stop TB Partnership, Roll Back Malaria Partnership and Global Fund to Fight AIDS, Tuberculosis and Malaria), national development agencies (e.g. Canadian International Development Agency, Swedish International Development Agency and UK Department for International Development) and civil society organizations (e.g. Red Cross, World Medical Association, International Society for Infectious Diseases and Médecins San Frontières). Some of them were even created as a direct response to dissatisfaction with WHO's leadership (Fox 1995). Public–private partnerships have also increasingly been seen as essential mechanisms for achieving global health security goals (Buse and Walt 2000a, 2000b; Buse and Waxman 2001; Widdus 2001; Yamey 2002; Kickbusch 2005; Cohen 2006), and the central importance of sub-national actors, including national institutes of public health and academic health centres, has also been recognized (Leggat and Tse 2003; Rodier et al. 2007). Finally, the emerging 'Health 8' (i.e. Gates Foundation, GAVI Alliance, Global Fund, UNAIDS, UNFPA, UNICEF, WHO and World Bank) (WHO 2007a; Silberschmidt et al. 2008) and the G7's Global Health Security Initiative (which also includes the European Union and Mexico) (GHSI Secretariat 2009) offer alternative sources of 'networked governance' for the global health security regime (Fidler and Gostin 2008). This proliferation of health security initiatives, indeed, has meant that WHO is merely one of many major global health security organizations in an increasingly crowded field.

New tools and renewed focus on global health law, human rights and health diplomacy

The framework within which states cooperate on public health issues has also recently been challenged. With the recent revision of the International Health Regulations and ratification of the WHO Framework Convention on Tobacco Control (WHO 2003b), many commentators have highlighted the utility of public international law as a mechanism for better structuring global health diplomacy during this time of increasing interdependence (Taylor 2002, 2004; Gostin 2005). A Framework Convention on Global Health has been proposed (Gostin 2007, 2008) and the proliferation of human rights discourse in the health field recognized (Gable 2007). While WHO has frequently been cited as a natural champion for this new legalistic approach to global health, there is also recognition that international health lawmaking would be neither workable nor desirable under the auspices of a single international agency (Taylor 2002). As the importance of health rises dramatically in the hierarchy of foreign policy objectives (Drager and Fidler 2007; Fidler 2007; Horton 2007; Støre 2007), there is also the possibility that more traditional forums of power will seek to expand their authority to include this increasingly vital domain.

Shock-activated vulnerabilities and new threats to health security

Finally, several recent focusing events have further raised doubts as to WHO's current capacity to address new threats to health security. For example, international concern for bioterrorism was exacerbated by each of the 1995 sarin gas attacks on Tokyo's subway system, the terrorist attacks of 11 September 2001 and the anthrax attacks in the United States throughout the autumn of 2001. The episode of SARS in 2003 and the H1N1 pandemic in 2009 further heightened awareness of the steep consequences of global pandemics (WHO 2003a; Gostin 2009), and the recent emergence and proliferation of extremely drug-resistant microbes has demonstrated the need for new techniques and strategies.

While WHO's central role in the new International Health Regulations points to its continued hegemony over health security, these catalytic agents of change highlight the challenges that face the organization in maintaining this position of dominance. A fifth global health security regime appears to be emerging.

Distributional consequences of the current global health security regime

The future of global health security governance, however, will not only be shaped by the identified catalytic agents of change but also by the prevailing regime's distributional consequences. The dominant principles, norms, rules and decision-making procedures of each period carry costs and

benefits for different groups of people and states based on various factors. Understanding these consequences can present opportunities to mitigate or promote them by informing future evolution in the regime.

First, as much as bacteria and viruses are largely ignorant of social divisions, disease invariably leads to disproportional repercussions for people in poverty, women and racial groups that already face discrimination. For example, many of the feared communicable diseases can be treated with existing medical knowledge, except that poorer people may not be able to afford treatment, take time off work to recuperate properly or find family members to take care of them. Women, similarly, are often isolated in many countries, benefit from fewer societal protections, encounter longer delays in accessing health services (Karim *et al.* 2007), suffer from gender stereotyping (Cook and Cusack 2009) and can face greater exposure to diseases from their traditional responsibility of caring for those who are sick. People who experience racial discrimination may also face artificial barriers to treatment, difficulty in accessing health services and greater stigma.

However, this inequitable burden of disease may not be alleviated proportionally depending on the way in which the world chooses to govern health security. A key element of early regimes, for example, was the belief that Europe had to be protected from the 'foreign' diseases of the developing world. This isolationist approach is most likely rooted in unfortunate beliefs of race-based hierarchies, the dirtiness of tropical disease and developing countries being a reservoir for illness (Aginam 2004). This approach to global health security strictly divides developed and developing countries into opposing camps, a stratification that was likely further entrenched by the latter's exclusion from global health decision-making. On one hand, this situation may be improving over time. Certain redistributional consequences, for example, are likely to emerge as the health security interests of wealthier countries increasingly align with the social and economic goals of less developed countries. Yet on the other hand, the incentive for the world's most powerful nations to continue asserting their influence and challenge developing countries' internal sovereignty remains substantial, especially given that global health security governance now operates in a sphere of action beyond the territoriality of any individual country (Kickbusch and de Leeuw 1999). One could even argue that wealthier countries to this day retain complete control over this area due to their significant political influence in multilateral forums and their financial capacity to support (or deny support to) their preferred global projects, including disease surveillance and pandemic preparedness (Calain 2007b). Indonesia's decision to withhold H5N1 virus samples in 2007 highlights this perceived power imbalance.

This historical convergence of health and traditional security interests has also led to far greater institutionalization and concern for the global health security regime (as compared with other public health issues) such that it has often dominated the global health agenda. This has led to a general 'securitization' of public health more broadly defined, which in turn carries wide-ranging consequences (Peterson 2002; Calain 2007a; Kelle 2007). Public health initiatives, for example, are increasingly being justified solely as defensive measures against the threat of epidemics or biological terrorism (Gursky 2004; Jolly and Ray

2006; United States Commission on the Prevention of Weapons of Mass Destruction 2008). While this focus may have resulted in greater investments by national governments in their health security, it has come at the expense of other traditional public health programmes, including screening, chronic diseases and health promotion (Staiti *et al.* 2003; Aldis 2008). Similarly, at the global level, the framing of health as a security issue has likewise been quite effective in rallying wealthy countries to guard against this common threat for all through enhanced bilateral aid. However, this development has also served to prioritize resources for certain communicable diseases to the detriment of all other health issues—often to the point of extreme disproportionality compared with the burden that is faced (Shiffman 2006). For example, infectious diseases receive 86% of WHO's budget for the Western Pacific but only account for 14% of the region's mortality. Non-communicable diseases, in contrast, earn a mere 13% of the budget and injury prevention only 1% even though they represent 75% and 10% of all deaths in the region respectively (Stuckler *et al.* 2008). The opportunity cost of this imbalance must be devastating.

Yet additional implications of the global health security regime's securitization of public health are foreseeable. Other consequences may include the further disempowerment of women (who are often sidelined in male-dominated security decision-making) (Cohn 1993), diminished compatibility with global development goals (which usually emphasize community empowerment rather than threat management), distortion of national health priorities (Biesma *et al.* 2009) and conflicts with local cultures (which may reject the biomedical approach to disease control). Recent debates in high-level WHO meetings reveal the growing opposition to this sweeping securitization of public health (Bhattacharya 2007), especially among policy-makers from developing countries who may be suspicious of their wealthier neighbours' intentions (Aldis 2008).

Considering possible future configurations of power

The evolutionary history of the global health security regime points to several future configurations of power in this area (see Table 3). While four possible orders will be considered separately to facilitate the analysis, the future will likely feature a combination of various elements from each moving in tandem based on the way global health politics evolve.

Greater authority for the World Health Organization

If states believe that global health security requires centralized leadership and fulfilment of WHO's core functions (Ruger and Yach 2009), they may decide to delegate (or WHO may wrest) more control and financial resources to the UN organization to create, administer and enforce stronger global health security regulations. Specific gaps in WHO's capabilities are highlighted by the current H1N1 pandemic and include its limited ability to monitor and enforce rules, facilitate capacity building in developing countries and demand the sharing of virus samples (Gostin 2009). States may also decide to implement proposals for more democratic, accountable and transparent WHO decision-making processes that empower and welcome

Table 3 Eventualities of the global health security regime

Future order	Contingent causes	Key characteristics	Catalytic factors	Consequences
Greater authority for WHO	• Current authority of WHO is inadequate for its responsibility of governing global health security • Decline of WHO's dominance in health security field • States are best suited to govern the global health security field • UN ideal for cooperation • WHO can harness new powers to better govern health security	• States delegate more control over both global and domestic health security to WHO • Greater financial resources for WHO's health security and other activities • Enforcement mechanism developed for the International Health Regulations • WHO restored as unquestionable leader of global health security	• Advantages of a universal mechanism for directing global health activities • Legitimacy of and respect for the UN system • Desire to build upon existing institutions • Recognized need for a single coordinating body for global health security	• Central coordinating body for global health security • Decline of omnipotent state power over public health issues • Continued cooperation through the UN, with all of its benefits and challenges • Universal participation in global health security governance
Dominance by a concert of powers	• WHO proves unable to effectively regulate communicable disease transmission • Cooperation through UN has failed or is not ideal for this field • Global health security best governed by smaller group of very powerful states	• A concert of powers like the G8 assumes leadership of global health security • Greater role for leading economic powers • Concert uses vast economic resources to achieve universal participation • Compels compliance using its substantial influence	• Diminished credibility of International Health Regulations and WHO • Decline of UN-style multilateralism • Concert recognizes national security and public health to be inherently connected • Practical efficiency of fewer decision-makers	• Concert recognized as health security leader • Further securitization of global health issues • Exclusive participation in global health security governance • Diminished role for WHO as a multilateral and universal forum
Global rebalancing among states	• Global health inequalities between developed and developing countries • Perceived control of WHO by developed countries via its budget • Growing frustration among developing and emerging nations • Desire for universal compliance in health security sphere among developed countries	• Either WHO is restructured or a new global health security organization is created that more equitably represents the views, concerns and needs of all countries • Focus on transfer of resources and expertise on health security from developed to developing countries	• Recognized need for global health equity among developed country policymakers • Health for all as a global responsibility • Recognized duty in politics, law and ethics to assist poorer states • Greater influence in health security demanded by developing and emerging countries	• Reorientation of communicable disease control to focus on developing and emerging country needs • Greater influence for developing and emerging countries in global health security governance • More resources devoted to global health activities • Increased transfers to developing countries
Civil society leadership	• WHO and national governments fail to effectively govern global health security • Loss of confidence in state-based systems of global governance (e.g. UN) • Proliferation and greater credibility for powerful civil society organizations	• Civil society organizations assume leadership of global health security field • Decentralized governance • Diffused leadership among many decision-makers • Greater number of policy pathways • Significant influence among funders of civil society organizations	• Expansion of resources in the civil society sector • Unwillingness of states to effectively collaborate or provide sufficient resources for global health security • Public–private partnerships • Declining trust in national governments and UN • Reliance on civil society for disease surveillance data	• Faster decision-making processes and innovation-catalyzing decentralized governance • Greater variability in governance and accountability of health security decision-makers • Less influence for countries with small populations • Diminished role for WHO

Notes: The contingent causes, key characteristics, catalytic factors and consequences of four possible future orders of global health security governance.

the participation of other influential global health actors (Silberschmidt *et al.* 2008). Giving greater authority to WHO would yield the advantages and disadvantages of building upon an existing institution, having a single coordinating agency and using an inclusive framework with near-universal participation. However, it relies upon WHO's ability to harness these new powers to better govern the global health security regime,

states' willingness to entrust further decision-making authority to the multilateral organization, and continued confidence and legitimacy in the UN system.

Dominance by a concert of powers

Alternatively, a powerful group of actors with world governance capabilities may challenge WHO's current dominance and

provide new solutions for governing global health security. Members of the G8/G20 or Health 8, for example, may collectively have the capacity to assume leadership in this area through networked governance (Fidler and Gostin 2008), and may be more effective in making the necessarily difficult decisions and coercing others to follow them. Indeed, the G8 has already demonstrated such interest through unprecedented engagement with global health policy at their recent 2008 Hokkaido Toyako Summit in Japan (Reich and Takemi 2009). A decision by the G8 to assert further control in this area could perhaps stem from democratic chauvinism or the inherent interdependence of security and health (Gursky 2004; Jolly and Ray 2006). Indeed, national self-interest has already encouraged wealthier countries to support the public health architecture of their poorer neighbours based on the notion that the health security of every country depends on the ability to prevent and respond to communicable diseases in each of them (Gostin and Archer 2007; Hein 2007; United Nations 2007; National Intelligence Council 2008; UK Government 2008; Institute of Medicine 2009). Dominance by a concert of powers like the G8/G20, however, presumes that states would have lost confidence in UN-facilitated multilateralism and that a concert of powers is capable and desirous of using its collective economic resources and political influence to compel adherence to their health security decisions. It also assumes that this concert will not repeat the G8's commitment–compliance gap (Labonte and Schrecker 2004), which indeed has improved since 1996 (Kirton et al. 2007; Kirton and Guebert 2009), as disenfranchised states would otherwise be less likely to cooperate.

While tying communicable disease control to the G8's more traditional areas of governance (e.g. peace, security and economic prosperity) could yield greater financial aid for developing countries, it could also be the ultimate demonstration that global health has become subservient to the national security interests of the world's most powerful states (Staiti et al. 2003; Aldis 2008). Divisions among developed, developing and emerging states may also be further exacerbated.

Global rebalancing with greater influence for developing and emerging countries

A third possibility is that WHO could be restructured, a new global health organization created, or an existing organization (like the Global Fund or Health 8) empowered to more equitably represent the views, concerns and aspirations of developing and emerging countries in health decision-making. Indeed, frustrated by developed countries' stranglehold on WHO via its policy of zero-nominal budget growth and conditional voluntary contributions, developing and emerging countries may demand a new approach to global health security governance in which they have greater influence. They may also demand greater transfers of resources, technology and expertise—all of which have recently been advocated for by international health organizations (Lazcano-Ponce et al. 2005). Alternatively, this future order could arise from recognition among policymakers in developed countries that health for all people is a global responsibility such that they have a duty to provide assistance to poorer states. Such a duty could be found in international law (e.g. International Health Regulations,

Universal Declaration of Human Rights, International Covenant on Economic, Social and Cultural Rights), political commitments (e.g. UN Millennium Declaration, G8 Communiqués, Doha Declaration on the TRIPS Agreement and Public Health) or ethical frameworks (i.e. developing countries have great need, developed countries have the ability to help and the public supports such assistance) (Gostin and Archer 2007). It could alternatively be part of a 'new global social contract for health' (Fidler 2007) or recognition for communicable disease control as a 'global public good' (Smith et al. 2004).

Greater influence for leaders in developing and emerging states may not only help them meet their development and equity goals but also work in the national security interests of developed countries (Bond 2008). Since bacteria and viruses are oblivious to state sovereignty, the historical dichotomization of the Global North and South may even have left much of the world 'multilaterally defenseless' against the threat they pose (Aginam 2004). Further, as the Indonesian virus-sharing incident demonstrates, wealthier countries may have to encourage compliance with the new International Health Regulations by conceding political decision-making power, offering greater financial support and promising equal access to future vaccines and treatments. The rise of Brazil, China, India and other growing powers may make such concessions by today's ruling states even more necessary and likely in the future.

Leadership of civil society organizations

Finally, civil society may assume leadership of preparing for and responding to a future crisis in this area. Such groups may be able to access greater financial resources, invoke faster decision-making processes, better align themselves with national health priorities, and benefit from their innovation-catalyzing decentralized governance structures. Indeed, their extensive contributions to global health policymaking have already been widely recognized in the academic literature (Lee and Dodgson 2000; Dodgson et al. 2002; Hein and Kohlmorgen 2009). This future order could possibly come about from the continuing proliferation and expansion of these organizations, trends towards greater utilization of public–private partnerships, and increasing reliance on this sector for disease surveillance data. However, this possible Balkanization of global health security governance would feature greater variability in the accountability of health security decision-makers, unclear responsibility and priority-setting (Kickbusch 2000, 2005), less influence for countries with small populations and a diminished role for WHO. It would also result in significantly more influence for the funders of civil society organizations as well as other wealthy entities—including for-profit corporations—that have the resources to engage in their own health security activities. Further adverse implications may emerge if many different actors launch independent initiatives with limited coordination or start competing for funds, media attention and legitimacy (Kickbusch 2005; Garrett 2007).

Conclusion

Understanding the evolution, etiology and possible eventualities of the global health security regime is crucial for all national

and international health policymakers, practitioners and academics alike to know where and how they must act to effectively prepare for tomorrow's most pressing challenges. This paper highlights four of many possible future configurations of power based on a multiplicity of contingent causes that may emerge, with recognition that the future will likely feature a web of elements from each depending on the dynamics of global health politics. Their characteristics and consequences urge renewed debate on the most effective and equitable global health security governance arrangements possible.

Several questions nevertheless remain unanswered. For example, there is still great uncertainty as to the effectiveness of the new International Health Regulations and the capacity of states to comply with them. The impact that additional well-funded civil society organizations will have on the regime also remains unknown, as does the possible influence that greater recognition for the 'right to health' will have to bear. A final question is whether the world is adequately prepared for the next global pandemic, or if another episode like SARS or H1N1 is needed to achieve the crucial changes. Further analysis is necessary.

Conflict of interest

Acknowledgements

Endnote

[1] An internal World Bank report obtained by Bloomberg indicates that a possible influenza pandemic could cost up to US$3 trillion.

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